

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A repeating radio frequency transmission system comprising:

(a) a transmitter capable of being placed in signal communication with an infrared remote control, the transmitter comprising:

- (1) a detector configured to receive a first infrared control signal from the infrared remote control and generate a first electrical signal according to the first infrared control signal;
- (2) a buffer coupled with the detector to store at least a portion of the first electrical signal;
- (3) a first code register for storing a first identification signal;
- (4) a multiplexor for combining the first electrical signal and the first identification signal into a first augmented electrical signal; and
- (5) a radio frequency transmitter responsive to the first augmented electrical signal for transmitting a radio signal representative of the first augmented electrical signal; and

(b) a receiver capable of being placed in infrared control signal communication with a controlled device, the receiver comprising:

- (1) a radio frequency receiver configured to receive the transmitted radio signal and for generating a second augmented electrical signal according to the received radio signal;
- (2) a second code register for storing a second identification signal;
- (3) a code detector for detecting the presence of the second identification signal within the second augmented electrical signal;

- (4) a second multiplexor in communication with the code detector for removing the second identification signal from the second augmented signal, leaving a second electronic signal;
- (5) an infrared emitter responsive to the second electronic signal for transmitting a second infrared control signal to the controlled device.

5

- 2. The repeating radio frequency transmission system of Claim 1, wherein the first and second code registers are Dual Inline Package switches.
- 10 3. The repeating radio frequency transmission system of Claim 1, wherein the first and second code registers are Read Only Memory.
- 4. The repeating radio frequency transmission system of Claim 1, wherein the first and second code registers are logical latches.
- 5. The repeating radio frequency transmission system of Claim 1, wherein the first and second code registers are Programmable Read Only Memory.
- 15 6. The repeating radio frequency transmission system of Claim 5, wherein the identification signal is stored in code registers by actuation of user-controlled switches.
- 7. The repeating radio frequency transmission system of Claim 5, wherein the identification signal is stored in code registers through actuation of user-controlled switches on the infrared remote control system.

20

8. The repeating radio frequency transmission system of Claim 5, wherein the identification signal is stored code registers by downloading codes from a computer.

9. The repeating radio frequency transmission system of Claim 1, wherein a plurality first identification signals are stored in the first code register.

5 10. The repeating radio frequency transmission system of Claim 9, wherein actuation of user-controlled switches determines which of the plurality of first identification signals stored in the code registers is available to the multiplexor.

11. The repeating radio frequency transmission system of Claim 10, wherein each of the plurality of identification codes are stored in one of the plurality of receivers.

10 12. The repeating radio frequency transmission system of Claim 11, wherein the user controlled switches are labeled to correspond with the devices controlled by each of the one or more receivers.

13. The repeating radio frequency transmission system of Claim 1, wherein a plurality of the first electrical signals are stored in the register.

15 14. The repeating radio frequency transmission system of Claim 13, wherein each or the plurality of first electrical signals is associated with a distinct function of a controlled device.

15. The repeating radio frequency transmission system of Claim 14, wherein each transmitter comprises a plurality of user-controlled switches for designating which of the associated first electrical signals is made available to the multiplexor.

16. The repeating radio frequency transmission system of Claim 15, wherein a plurality of the first electrical signals are stored in association with a plurality of controlled devices.

17. The repeating radio frequency transmission system of Claim 16, wherein each transmitter comprises a plurality of user-controlled switches for designating one of the plurality of controlled devices.

18. The repeating radio frequency transmission system of Claim 1, wherein the transmitter is mechanically coupled to the infrared remote control.

19. A repeating radio frequency transmission system comprising:

10 (a) a transmitter capable of being placed in signal communication with an infrared remote control, the transmitter comprising:

- (1) a detector configured to receive a first infrared control signal from the infrared remote control and generate a first electrical signal according to the first infrared control signal;
- (2) a buffer coupled with the detector to store at least a portion of the first electrical signal;
- (3) a first code register storing a first identification signal;
- (4) a modulator to convert the first electrical signal to a first radio signal;
- (5) a multiplexor for combining the first radio signal and the first identification signal into an augmented radio signal; and
- (6) a first antenna responsive to the augmented radio signal for transmitting the augmented radio signal; and

(b) one or more receivers capable of being placed in infrared control signal communication with a controlled device, the receiver comprising:

- (1) a second antenna to receive the augmented radio signal;
- (2) a second code register for storing a second identification signal;
- 5 (3) a code detector for detecting the presence of the second identification signal within the augmented radio signal;
- (4) a second multiplexor in communication with the code detector for removing the second identification signal from the augmented radio signal, leaving a second radio signal;
- 10 (5) a demodulator to convert the second radio signal to a second electronic signal; and
- (6) an infrared emitter responsive to the second electronic signal for transmitting a second infrared control signal to the controlled device.

15 20. The repeating radio frequency transmission system of Claim 19, wherein the first and second code registers are Dual Inline Package switches.

21. The repeating radio frequency transmission system of Claim 19, wherein the first and second code registers are Read Only Memory.

22. The repeating radio frequency transmission system of Claim 19, wherein the first and second code registers are logical latches.

23. The repeating radio frequency transmission system of Claim 19, wherein the first and second code registers are Programmable Read Only Memory.

24. The repeating radio frequency transmission system of Claim 23, wherein the identification signal is stored in code registers by actuation of user-controlled switches.

25. The repeating radio frequency transmission system of Claim 23, wherein the 5 identification signal is stored in code registers through actuation of user-controlled switches on the infrared remote control system.

26. The repeating radio frequency transmission system of Claim 23, wherein the identification signal is stored code registers by downloading codes from a computer.

27. The repeating radio frequency transmission system of Claim 19, wherein a plurality 10 first identification signals are stored in the first code register.

28. The repeating radio frequency transmission system of Claim 27, wherein actuation of user-controlled switches determines which of the plurality of first identification signals stored in the code registers is available to the multiplexor.

29. The repeating radio frequency transmission system of Claim 28, wherein each of the 15 plurality of identification codes are stored in one of the plurality of receivers.

30. The repeating radio frequency transmission system of Claim 29, wherein the user controlled switches are labeled to correspond with the devices controlled by each of the one or more receivers.

31. The repeating radio frequency transmission system of Claim 19, wherein a plurality of 20 the first electrical signals are stored in the register.

32. The repeating radio frequency transmission system of Claim 31, wherein each or the plurality of first electrical signals is associated with a distinct function of a controlled device.

5       33. The repeating radio frequency transmission system of Claim 32, wherein each transmitter comprises a plurality of user-controlled switches for designating which of the associated first electrical signals is made available to the multiplexor.

34. The repeating radio frequency transmission system of Claim 34, wherein a plurality of the first electrical signals are stored in association with a plurality of controlled devices.

10      35. The repeating radio frequency transmission system of Claim 35, wherein each transmitter comprises a plurality of user-controlled switches for designating one of the plurality of controlled devices.

36. The repeating radio frequency transmission system of Claim 19, wherein the transmitter is mechanically coupled to the infrared remote control.

15      37. A method for transmitting an infrared control signal to a controlled device, comprising:

- (a) receiving an infrared control signal;
- (b) augmenting the IR signal by adding an identifying signal resulting in an augmented electronic signal;
- 20      (c) converting the augmented electronic signal to a radio frequency signal;
- (d) transmitting the radio frequency signal; and,
- (e) receiving the radio frequency signal.

38. The method of Claim 37 wherein receiving an infrared control signal comprises generating a first electronic signal according to the received infrared control signal.

39. The method of Claim 38 wherein receiving an infrared control signal comprises retrieving a first identifying signal from a first code register.

5 40. The method of Claim 38 wherein receiving an infrared control signal comprises storing the first electronic signal in association with a function of the controlled device.

41. The method of Claim 40 wherein storing the first electronic signal in association with a function of the controlled device comprises retrieving a stored signal.

10 42. The method of Claim 37 wherein the receiving the radio frequency signal comprises the step of detecting whether the identifying signal is present in the radio frequency signal.

43. The method of Claim 37 wherein the step of receiving the radio frequency signal comprises generating an infrared control signal according to the radio frequency signal.

15

44. The method of Claim 37 wherein receiving the radio frequency signal comprises transmitting the infrared control signal to the controlled device.

45. The method of Claim 37 wherein receiving the radio frequency signal comprises generating a second augmented signal according to the received radio frequency signal;

20

46. The method of Claim 45 wherein receiving the radio frequency signal comprises the step of retrieving a second identifying signal from a second code register.

47. The method of Claim 46 wherein retrieving a second identifying signal from a second code register comprises determining the presence of the second identifying signal in the second augmented signal.

5 48. The method of Claim 37 wherein, prior to receiving an infrared control signal, the method comprises storing the first and second identification signals in the first and second code registers respectively.

10 49. The method of Claim 37 wherein storing the first identification signal in the first code register comprises storing of a plurality of first identification signals in the first code register.

50. The method of Claim 49 wherein storing of a plurality of first identification signals in the first code register includes associating the stored first identification signals with controlled devices.

15 51. A method for transmitting an infrared control signal to a controlled device, comprising:

(a) receiving an infrared control signal;

(b) converting the received infrared control signal to a radio frequency signal;

(c) augmenting the radio frequency signal by adding an identifying signal

20 resulting in an augmented radio frequency signal;

(d) transmitting the augmented radio frequency signal;

(e) receiving the augmented radio frequency signal;

- (f) removing the identifying signal from the augmented signal;
- (g) generating an infrared control signal according; and
- (h) transmitting the infrared control signal to the controlled device.

52. The method of Claim 51 wherein receiving an infrared control signal comprises  
5 generating a first electronic signal according to the received infrared control signal.

53. The method of Claim 52 wherein receiving an infrared control signal comprises  
10 retrieving a first identifying signal from a first code register.

54. The method of Claim 52 wherein receiving an infrared control signal comprises  
15 storing the first electronic signal in association with a function of the controlled  
device.

55. The method of Claim 54 wherein storing the first electronic signal in association with  
a function of the controlled device comprises retrieving a stored signal.

56. The method of Claim 51 wherein the receiving the radio frequency signal comprises  
15 the step of detecting whether the identifying signal is present in the radio frequency  
signal.

57. The method of Claim 51 wherein the step of receiving the radio frequency signal  
comprises generating an infrared control signal according to the radio frequency  
signal.

58. The method of Claim 51 wherein receiving the radio frequency signal comprises  
20 transmitting the infrared control signal to the controlled device.

59. The method of Claim 51 wherein receiving the radio frequency signal comprises generating a second augmented signal according to the received radio frequency signal;

60. The method of Claim 59 wherein receiving the radio frequency signal comprises the 5 step of retrieving a second identifying signal from a second code register.

61. The method of Claim 51 wherein retrieving a second identifying signal from a second code register comprises determining the presence of the second identifying signal in the second augmented signal.

62. The method of Claim 51 wherein, prior to receiving an infrared control signal, the 10 method comprises storing the first and second identification signals in the first and second code registers respectively.

63. The method of Claim 51 wherein storing the first identification signal in the first code register comprises storing of a plurality of first identification signals in the first code register.

15 64. The method of Claim 63 wherein storing of a plurality of first identification signals in the first code register includes associating the stored first identification signals with controlled devices.

65. A method for transmitting an infrared control signal to a controlled device comprising:

20 a) Providing a memory containing a database of control signals associated with controlled devices;

b) Designating a desired function of the controlled device;

- c) Retrieving the appropriate control signal from the database;
- d) augmenting the IR signal by adding an identifying signal resulting in an augmented electronic signal;
- e) generating a radio frequency signal according to the first augmented electronic signal;
- 5 f) converting the augmented electronic signal to a radio frequency signal;
- g) transmitting the radio frequency signal;
- h) receiving the radio frequency signal; and,
- i) detecting the presence of the identifying signal in the augmented signal.

10 66. The method of Claim 65 wherein receiving an infrared control signal comprises generating a first electronic signal according to the received infrared control signal.

67. The method of Claim 66 wherein receiving an infrared control signal comprises retrieving a first identifying signal from a first code register.

15 68. The method of Claim 67 wherein receiving the augmented radio frequency signal comprises the step of generating a second augmented signal according to the received radio frequency signal;

69. The method of Claim 68 wherein receiving the augmented radio frequency signal comprises the step of retrieving a second identifying signal from a second code register.

20 70. The method of Claim 69 wherein retrieving a second identifying signal from a second code register comprises determining the presence of the second identifying signal in the second augmented signal.

71. The method of Claim 65 wherein, prior to receiving an infrared control signal, the method comprises storing the first and second identification signals in the first and second code registers respectively.

72. The method of Claim 65 wherein receiving the augmented radio frequency signal  
5 includes generating an infrared control signal according to the augmented radio frequency signal.

73. The method of Claim 65 wherein receiving the augmented radio frequency signal includes transmitting the infrared control signal to the controlled device.